

#### REMARKS/ARGUMENTS

Claims 1 to 40 are currently pending in the application. The Examiner has objected to the specification due to the incorporation by reference of certain patent applications. The Examiner has also objected to claims 25 and 36 as allegedly including informalities. The Examiner has rejected claims 1, 2, 7, 21, 22, 31 and 32 under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 7,239,611 to Khisti et al. Claims 3 and 27 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Khisti in view of U.S. Patent No. 7,218,610 to Sivakumar et al. Claims 4 and 28-30 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Khisti in view of Sivakumar and U.S. Patent No. 7,222,190 to Klinker et al. Claims 5, 6, 39 and 40 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Khisti in view of Klinker. Claims 8, 14, 15 and 16 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Khisti in view of U.S. Patent No. 6,757,255 to Aoki et al. Claims 17-20, 26 and 33 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Khisti in view of U.S. Patent No. 6,757,248 to Li et al. Claims 23-25 have been rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Khisti in view of U.S. Patent No. 7,154,858 to Zhang et al. The Examiner has indicated, however, that claims 9-13 and 34-38 contain allowable subject matter.

In response to the Examiner's objection to the specification, Applicant has amended the specification correct the reference to U.S. Application Ser. No. 10/676,631. In addition, Applicant has amended the application to account for the issuance of Application Ser. No. 10/039,992 as U.S. Patent No. 7,032,072.

The Examiner then goes on to list a number of unpublished patent applications referred to in the specification. None of the referenced applications, however, is "essential" within the meaning of 37 C.F.R. § 1.57(b). Accordingly, no further action appears to be required at this time.

#### The Prior Art Rejections

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." See MPEP § 2131 (quoting *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)).

The U.S. Patent and Trademark Office has just recently issued new guidelines for determining obviousness under 35 U.S.C. § 103 in view of the Supreme Court's decision in *KSR Int'l Co. v. Teleflex Inc.* See Federal Register/Vol. 72, No. 195 at 57526. Consistent with past practice, however, the guidelines still require Examiners, when basing rejections on the combination of prior art, to articulate either 1) "a finding that the prior art included each element claimed," see Federal Register/Vol. 72, No. 195 at 57529; or 2) "a finding that there was some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings." See Federal Register/Vol. 72, No. 195 at 57534.

Claims 1, 21 and 32 are the independent claims in the present application. Applicants' remarks will focus on the rejections of the independent claims, given the

degree to which the Office Action fails to establish a prima facie case of invalidity as to these independent claims. Applicant has amended claim 1 slightly in a manner more consistent with the subject matter of claims 21 and 32.

The claimed subject matter is directed to overcoming the inefficiencies introduced by statically allocating a fixed amount of bandwidth to data flows, such as TCP flows, that feature slow start mechanisms. As the application describes, given that TCP flows typically have a slow-start phase and gradually ramp up to a steady state rate, allocating bandwidth based on the steady state rate wastes bandwidth as it over-allocates bandwidth to a given data flow during the slow-start phase. As the application recognizes, this unutilized bandwidth could in fact be allocated to other flows and, therefore, achieve a more efficient bandwidth allocation scheme.

Claim 1 of the application, therefore, "[allocates] bandwidth for the flow, wherein the allocated bandwidth is a fraction of the initial rate demand for the flow," and "[increases] the bandwidth allocated to the flow" as a packet count associated with the flow crosses a threshold. Similarly, claim 21 includes a bandwidth allocation module that allocates bandwidth to a data flow based on a "target rate associated with the data flow." The apparatus initially sets the target rate "as a fraction of the initial rate demand for the flow," and "increase[s] the target rate associated with the data flow as the count of bytes crosses a threshold value." Claim 32 includes similar limitations to claim 21.

The Examiner primarily relies on Khisti as a basis for rejecting the claims. A closer inspection of Khisti reveals, however, that such reliance is misplaced. Khisti teaches a system that controls the admission of data streams onto a network. It does not teach a system that increases the bandwidth allocated to individual flows as packets of

the flows are encountered. In the system taught by Khisti, a transmitting and receiving end system conduct a set of diagnostic tests (passive and/or active) to determine whether sufficient bandwidth exists (i.e., testing for "bottleneck bandwidth") to initiate a requested data stream at a data rate requested by the client application hosted by the receiving end system. Khisti, Col. 5, lines 32-49; see also Col. 10, lines 40-57 (streams requested by applications hosted by end systems). Accordingly, when a client application requests a data stream at a requested data rate, a series of tests are conducted between the transmitting and receiving end systems to determine whether sufficient bandwidth exists for the data stream. See Khisti, Col. 11, line 29 et seq. Nowhere, however, does Khisti teach initially allocating bandwidth to a data flow based on a fraction of a target rate, and then increasing the allocated bandwidth as a packet count associated with the data flow increases. Rather, as discussed below, Khisti teaches a system that tests for sufficient bandwidth for a data stream prior to admission of the data stream on a network. Once that data stream is admitted onto the network, Khisti does not teach a system that progressively increases the bandwidth allocated to that flow. Furthermore, although Khisti teaches end systems that employ slow-start mechanisms (e.g., TCP hosts), it appears that the invention of Khisti is actually directed to a system involving data streams that include a fixed target rate and do not include a slow start phase. Indeed, Khisti teaches that most data streams operate utilizing datagram protocols without congestion controls, since they require or operate at fixed or minimum rates. See Khisti, Col. 2, lines 37-56. In any event, Khisti does not teach a bandwidth allocation mechanism that responds to any slow-start phase of a data flow.

Turning specifically to the allegations in the Office Action, the Examiner alleges that Khisti teaches estimating an initial rate demand for a data flow, and allocating a

fraction of the initial rate demand for the flow. See, e.g., Office Action at ¶ 8. The Examiner has misconstrued the teachings of Khisti. For example, Khisti, at Col. 12, lines 37-42, merely teaches that a network administrator may configure an "Acceptable\_Loading" parameter that allocates a portion of the entire link capacity to data streams in the aggregate (not individual flows). See Khisti, Col. 12, lines 52-54 (Acceptable\_Loading parameter can be configured to reserve some amount of bandwidth for non-streaming data). Accordingly, the Acceptable Loading parameter of Khisti is a global parameter that is not responsive to the initial rate demands corresponding to individual flows. For example, if the Available Bandwidth (controlled in part on the Acceptable\_Loading parameter—see Equation 1 at Col. 12) is less than the requested rate demand for a data stream, the data stream is not transmitted. See Khisti, Col. 13, lines 9-40.

The Examiner also incorrectly alleges that Khisti teaches "increasing the fraction of the initial rate demand allocated to the flow as the count crosses at least one threshold." The passages of Khisti cited by the Examiner, however, are not directed to allocating bandwidth in an increasing manner. Rather, the cited passages describe how the results of the diagnostic tests (such as active probing) can be analyzed in order to determine whether congestion is likely and thus whether to admit a data stream. The cited passage of Khisti does not describe a process where the rate allocated to a data flow is increased as additional packets of the data flow are detected.

Although it has been thoroughly demonstrated that Khisti does not anticipate claim 1, the Examiner's analysis of certain dependent claims also deserves mention. As to claim 2, for example, the Examiner incorrectly alleges that a teaching in Khisti for estimating the available bandwidth for a data stream (Col. 16, lines 40-44), is equivalent

to estimating the number of bytes that a first host will transmit until the initial rate demand is achieved. This allegation is specious. Applicants query the Examiner as to how estimating available bandwidth is equivalent to estimating an amount of bytes that will be transferred until the observed data rate consumed by a first host will actually be achieved.

Still further, the Examiner incorrectly alleges that Aoki teaches estimating a number of packets that a first host will transmit before achieving the initial rate demand. See Office Action ¶ 13. Aoki, however, merely teaches testing the available bandwidth across a data path (see Col. 19, lines 52-58. Indeed, the number of packets determined in the passage of Aoki cited by the Examiner (Aoki, Col. 19, line 62 to Col. 20, line 7) appears to merely be a determination of the number of test packets to send in a given testing loop. This has no relation to estimating the number of packets a host will transmit prior to ramping up to an initial rate demand.

The foregoing reasoning applies equally to independent claims 21 and 32. Furthermore, since the Examiner relies on the secondary references for subject matter of the dependent claims, the rejections under 35 U.S.C. § 103(a) are also fatally defective based on the deficiencies of Khisti as a primary reference.

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In light of the foregoing, Applicant believes that all currently pending claims are presently in condition for allowance. Applicant respectfully requests a timely Notice of Allowance be issued in this case. If the Examiner believes that any further action by Applicant is necessary to place this application in condition for allowance, Applicant requests a telephone conference with the undersigned at the telephone number set forth below.

Respectfully Submitted,  
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